



PCT/AU2004/001414

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Canberra**

I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2003905704 for a patent by CASTALLOY MANUFACTURING PTY LTD as filed on 17 October 2003.



WITNESS my hand this  
Twenty-sixth day of October 2004

A handwritten signature in cursive script, reading "J. Billingsley".

JULIE BILLINGSLEY  
TEAM LEADER EXAMINATION  
SUPPORT AND SALES

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AUSTRALIA  
Patents Act 1990

**ORIGINAL**

**PROVISIONAL SPECIFICATION FOR AN INVENTION  
ENTITLED**

Invention Title: TUBELESS WIRE SPOKED WHEEL  
Name of Applicant: CASTALLOY MANUFACTURING PTY LTD  
Address for Service: COLLISON & CO. 117 King William Street,  
Adelaide, S.A. 5000

**The invention is described in the following statement :**

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The present invention relates to a tubeless wire spoked (laced) wheel.

Wire spoked wheels generally have a rim upon which a pneumatic tyre is mounted, and a hub connected to the rim of the wheel via an array of spokes.

5 The tyres employed on wire-spoked wheels generally require an inflatable inner tube, in order to create a properly sealed, air-tight chamber. This is due to the fact that the spokes typically connect to the rim by projecting through a plurality of holes in the rim of the wheel, such that without an inner tube, the holes in the rim would permit the leakage of air there through.

10 The advantage of using tubeless tyres over conventional tubed tyres, include reduced weight and rolling resistance. As such, numerous attempts have been made to produce a tubeless spoked wheel. One of the best known methods involves applying a sealing means, which is typically an impervious, self adhesive tape, over the spoke nipples in the rim well. There are numerous problems associated with this technique however. Firstly, the nipple heads  
15 protrude above the well floor of almost all conventional spoked (laced) wheels. Secondly, the well floor of some conventional spoked wheels, have a concave curve to them. These two factors combine to create a rim well floor surface that is extremely irregular, and the inventor has yet to find non-permeable self adhesive tape that can seal such a surface and withstand  
20 inflation pressures.

It is an object of the present invention to provide a tubeless wire spoked wheel that overcomes or at least substantially ameliorates the problems associated with the tubeless wire wheels of the prior art.

25 Other objects and advantages of the present invention will become apparent from the following description, taken in connection with the accompanying drawings, wherein, by way of illustration and example, an embodiment of the present invention is disclosed.

In one form of this invention although this may not necessarily be the only or indeed the broadest form of this there is proposed a tubeless wire spoked wheel assembly wherein there is a wheel rim having a substantially planar surface in the bottom of the rim tyre well, and the thickness of the rim through  
5 the bottom of tyre well is locally reduced so as to define a recessed portion in which a spoke nipple can be completely recessed relative to the planar surface, such that a hermetic sealing means can be applied to the planar surface without interference from the spoke nipple.

In preference, the rim is produced via an extrusion process.

10 In preference, the rim is extruded from aluminium and/or magnesium.

In preference, the recessed portion is a countersunk hole.

In preference, the sealing means is an impervious, self adhesive tape.

In preference, the planar surface in the bottom of the rim tyre well is substantially flat.

15 In preference, the wheel rim has a relatively constant cross section

In a further form of the invention, the rim of the wheel may be produced by a casting process.

In preference, the rim is cast from aluminium and/or magnesium.

From time to time, it is necessary to adjust the tensions of the spokes; for  
20 instance, when a spoke has become loose, or the wheel has become buckled. Spokes are generally tensioned by using a nipple wrench to rotate a threaded nipple. In conventional wheels however the impervious, self adhesive tape, is placed over the spoke nipples such that the tape is in direct contact with the nipple. Any attempt to rotate the nipple using a nipple wrench therefore, is  
25 likely to damage the tape and the seal, allowing the tyre to leak. A significant advantage of the tubeless spoked wheel according to the preferred

embodiment, therefore, is that the spoke nipples can be adjusted (rotated) without affecting the airtight seal.

For a better understanding of this invention it will now be described with respect to the preferred embodiment which shall be described herein with the assistance of drawings wherein;

Figure 1 is a perspective, partial cross-sectional view of the tubeless wire spoked wheel according to the preferred embodiment of the present invention; and

Figure 2 is a detail cross-sectional view of the tubeless wire spoked wheel as shown in Figure 1.

Figure 3 is a detailed cross-sectional view of a conventional wire spoked rim and wheel assembly, as would be used on a motorcycle.

Now referring to the illustrations, and in particular to Figure 1, there is a wheel and tyre assembly 1, including a tubeless tyre 2, a hub 3, a rim 4, and an array of spokes 5.

The embodiment of the invention as illustrated herein, is shown in relation to a motorcycle wheel assembly, but it should be appreciated that the invention is not so limited. In fact the invention is equally applicable to any and all applications to which a spoked wheel may be suited, including for instance car and bicycle wheel assemblies.

Referring now to Figure 2, where it can be seen that the rim 4 is substantially concave in cross-section, and has inwardly projecting annular flanges 10 and 15, having annular beads seats 30 and 35 respectively formed on them, which assist in seating the beads 20, and 25 of the tyre 2.

The rim 4, has a constant cross-section, which lends itself to manufacture by extrusion; but it is conceivable that it could also be produced by a casting process. The rim 4 is manufactured with a sufficient thickness, such that the

spoke nipple 45 and its respective spoke 50, can be located in a countersunk hole 40, that passes through the rim.

5 The rim 4 also has a substantially planar surface 55 in the bottom of the rim tyre well. As the spoke nipple 45 sits in the countersunk hole 40, the head of the spoke nipple is completely recessed relative to the planar surface 55, and does not interrupt it by protruding at all. An impervious, self adhesive tape 60, can then be applied to the planar surface 55, hermetically sealing the cavity 65, created by the tyre 2 and rim 4. The planar surface 55, defined by the rim lends itself to effective sealing using a tape 60, but it is a conceivable that  
10 anyone of a number of alternate sealing products could be successfully employed here due to the favourable sealing surface created.

By way of comparison with a conventional wire spoked rim assembly 70, where the spoke nipples 75 protrude above the floor level 90 of the well 95; making attempts to hermetically seal the spoke nipples problematic.

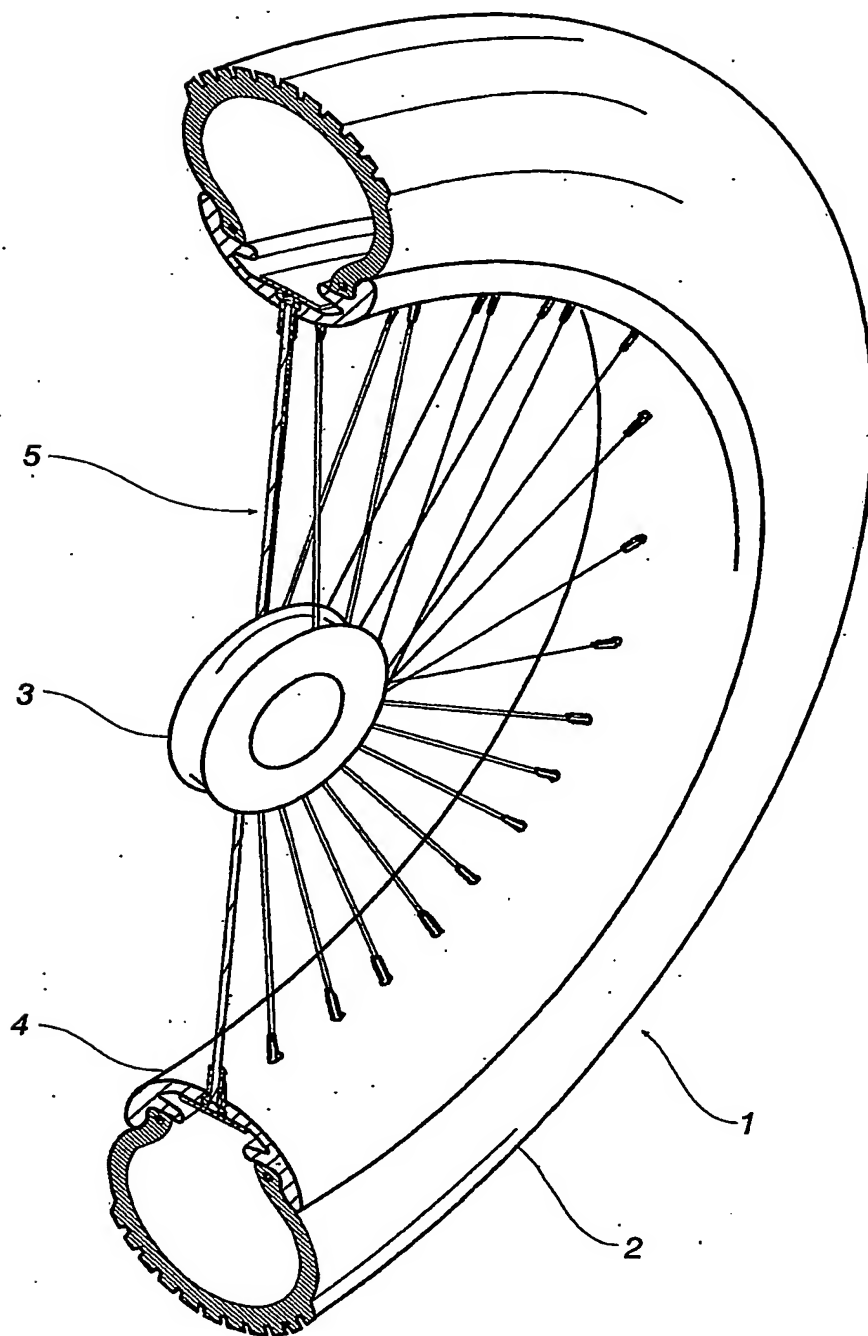
15 It is considered that spoked wheels such as those described herein would prove to be of considerable benefit where it is preferable to be able to use a tubeless tyre.

Although the invention has been herein shown and described in what is conceived to be the most practical and preferred embodiment, it is recognised  
20 that departures can be made within the scope of the invention, which is not to be limited to the details described herein but is to be accorded the full scope of the appended claims so as to embrace any and all equivalent devices and apparatus.

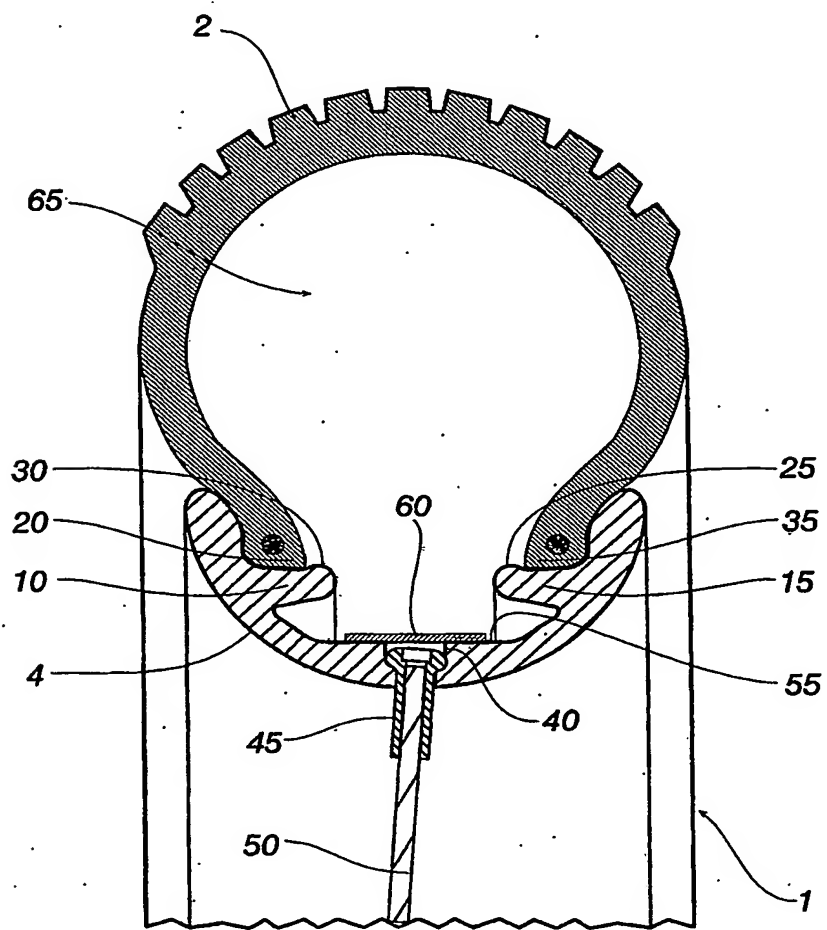
Dated this 17th day of October 2003

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CASTALLOY MANUFACTURING PTY LTD  
By their Patent Attorneys,  
COLLISON & CO.



**Fig 1**



**Fig 2**



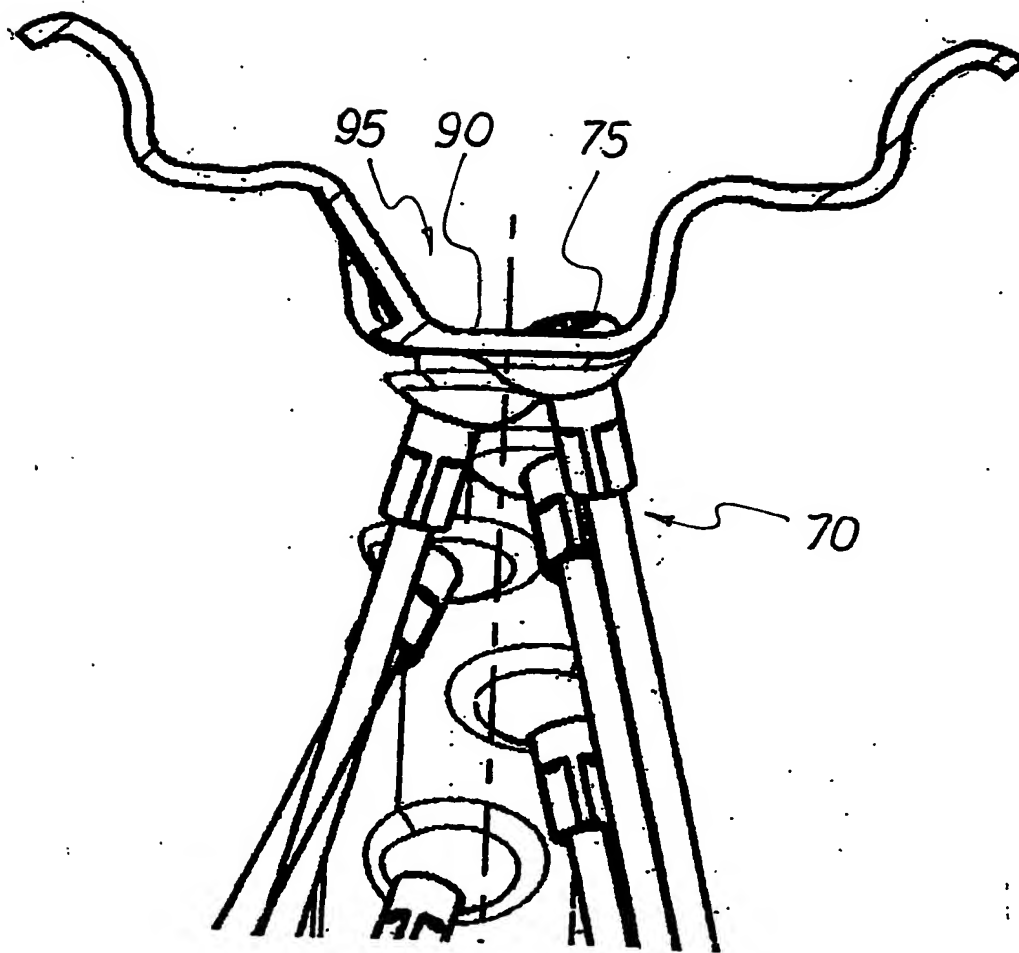


Fig 3

# Document made available under the Patent Cooperation Treaty (PCT)

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